

WHAT IS CLAIMED IS:

1. A liquid crystal cell, comprising:

a first substrate;

a plurality of parallel columns of director alignment material disposed on a surface
of the first substrate, each one of the columns having a longitudinal axis
disposed at an oblique angle with respect the surface of the first substrate,
each one of the columns terminating in a distal end having a substantially
flat surface;

a second substrate; and

a liquid crystal material disposed between the surfaces of the first and second
substrates with portions of such liquid crystal material being in contact with
the parallel columns of director alignment material.

2. A liquid crystal substrate structure, comprising:

a substrate;

a plurality of parallel columns of director alignment material disposed on a surface
of the substrate, each one of the columns having a longitudinal axis disposed
at an oblique angle with respect the surface of the substrate, each one of the
columns terminating in a distal end having a substantially flat surface.

3. A method for forming a liquid crystal substrate structure, comprising:

providing a substrate in a chamber;

subjecting a surface of the substrate to a deposition flux of director alignment
material with such flux passing to the substrate surface along a first axis
having an oblique angle with respect to the surface of the substrate with a
beam of particle being directed to the surface of the substrate along a second
axis, the second axis being at an obtuse angle with respect to the first axis to
produce a director alignment layer;

disposing a liquid crystal material on the director alignment layer.

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4. A method for forming a liquid crystal cell, comprising:

providing a liquid crystal cell substrate in a vacuum chamber having an electron
beam evaporation source for producing a flux of director alignment material
from the source along a first direction, a substrate holder, and an ion gun for
directing ions towards the surface of the substrate along a direction opposite
to the first direction;

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affixing a substrate to the substrate holder with a surface of the affixed substrate
disposed an oblique angle with respect to the first direction;

producing in the chamber a plurality of columns of the director alignment material
comprising activating the evaporation source of the director alignment
material and the ion gun to produce the flux of director alignment material
from the source along the first direction with the an ion gun for directing
ions towards the surface of the substrate along the direction opposite to the
first direction;

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removing the substrate with the columns of director alignment material from the
chamber;

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placing a liquid crystal material on the produced director alignment layer.